APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/732,003	12/10/2003	James June-Ming Wang	4980-103 US	6220

7590 05/17/2006	EXAMINER
Diane Dunn McKay, Esq.	CHAN, RICHARD

ART UNIT	PAPER NUMBER
2618	

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DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/732,003	WANG ET AL.
	Examiner	Art Unit
	Richard Chan	2618

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*10 December 2003*</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,7,8,10,13-16,19-21,24-26,30,32,35,38-41,43-45,49 and 50* is/are rejected.

7)☒ Claim(s) *2-4,6,9,11-15,17,18,22,23,27-29,31,33,34,36-40,42,43,47 and 48* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12/10/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date *3/15/04*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 49, 50, and 51 have been renumbered 48,49, and 50.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 13-15, 32, 38-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 8 and 32, the method of claim 1 wherein said weights are applied to a respective one at said input signals using a modulator. The word "one" in unclear in its usage in the claim.

With respect to claims 13-15 and 38-40, equations claimed fail to define all variables within the claims.

Claim 18 and 43 recites the limitation "said INA" in lines 12 and 18 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,5,16, 26, 30, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Iinuma (US 6,161,001).

With respect to claim 1 and 26, Inuma discloses a method for operating a wireless communication system receiver comprising of receiving a plurality of input signal 301-304; weighting said plurality of input signals with 317, 318, 321, and 324 (Col6. lines 43-53); and combining said weighted plurality of signals with combiner 325 and 326 to form an output signal, wherein weights used in said weighting step are adjusted to increase power in said output signal of in-band components and decrease power in said output signal of out of band components.

With respect to claims 5 and 30, Inuma discloses the method of claim 1 wherein said weights are determined by the steps of determining a complex error signal by a complex conjugate multiplication of each said input signals and a reference complex signal; and low pass filtering said error signal to determine said antenna weights.

With respect to claims 16 and 41, Iinuma discloses the method of claim 1 wherein after said combining step further comprising the step of: applying a conjugate of one of said weights to said output signal. Col.7 lines 5-15

Claim 19-21, 24, 44, and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Voyer (US 6,680,699).

With respect to claim 19 and 44, Voyer discloses wherein a method for operating a transmit and receive beam forming system comprising the steps of: receiving a plurality of input signals with antennas 300; weighting said plurality of input signals with weights (Col.1 lines 14-27), weights are adjusted to increase power in said output signal of in-band components and decrease power in said output signal of out of band components; and combining said weighted plurality of signals to form an output signal; transmitting a beam with beam formers 310 towards a desired signal detecting wherein a complex conjugate with conjugation modules 530 said weights are used for transmitting said beam.

With respect to claim 20, Voyer discloses wherein after step b. said weights are frozen and said weights are applied for transmitting in step d. (Col.1 lines 14-29) the weights value must be maintained in order to create a transmitting beam.

With respect to claims 21 and 45, Voyer discloses the method of claim 1 wherein said weights are determined by the steps of determining a complex error signal by a complex conjugate multiplication of each said input signals and a reference complex signal; and low pass filtering said error signal to determine said antenna weights.

With respect to claim 24, Voyer discloses wherein the method of claim 20 wherein steps a-d are repeated for a plurality of devices.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 7 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iinuma (US 6,161,001) in view of Shapira (US 2003/0162566 A1).

With respect to claim 7 and 32, Iinuma disclose the method of claims 1 and 26, however Iinuma does not disclose wherein said weights are applied to a respective one at said input signals using a modulator.

The Shapira reference however discloses wherein modulators 5120 accept the weighted sum of components I and Q. [Paragraph 0076 & 0077]

It would have been obvious to one of ordinary skill in the art to implement the modulators which accept the weighted sum as disclosed by Shapira with the diversity receiver as disclosed by Iinuma in order to used the weighted value to modify the output signal.

Claim 10 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iinuma (US 6,161,001) in view of Smee (US 6,161,001).

With respect to claims 10 and 35, Inuma discloses the method of claim 1, however Iinuma does not specifically disclose wherein said weights used in said weighting step are adjusted by the step of adding an error signal into said weights to cancel said out-of-band components.

The Smee reference however discloses wherein an error signal from transversal filter 402 is provided to the weight control unit 404 in order to implement an RLS algorithm for filter 402.

It would have been obvious to one of ordinary skill in the art to implement the method wherein you add an error signal into said weights as disclosed by Smee with

the Diversity receiver as disclosed by Smee in order to cancel out of band components within a signal.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voyer (US 6,680,699) in view of Iinuma (US 6,161,001).

With respect to claim 25, Voyer discloses the method of claim 24, however Iinuma does not specifically disclose wherein after steps a-c further comprising the steps of identifying said weights for one of said devices; and storing said identified weights; and during said transmitting step d. retrieving said stored identified weight for said device.

The Iinumna reference however discloses a storage means designed to store and output phase data and the combination coefficient.

It would have been obvious to one of ordinary skill in the art to implement the storage ability as disclosed by Iinuma with the method as disclosed by Voyer in order to store the value of a weight derived by the Voyer system and use the value stored for identification.

Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iinuma (US 6,161,001) in view of Treichler.

With respect to claims 49 and 50, Iinuma discloses the system of claim 44, however Iinuma does not disclose wherein said weights are determined by a constant modulus algorithm.

The Treichler reference however discloses wherein weight vectors are determined by a constant modulus algorithm. Pages 461 paragraph 7-8

Allowable Subject Matter

Claims 2-4, 6, 8, 9, 11-15, 17, 18, 22, 23, 27-29, 31, 33, 34, 36 - 40, 42,43, and 47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claim 2 and 27, Iinuma discloses the method of claim 1 wherein said weights are determined by maximal ratio combining to align phases of said input signals to the same phase and to scale said input signals proportion to a square root of a received signal to noise ratio. The prior art does not disclose wherein said input signals are proportion to a square root of a received signal to noise ratio.

Claims 3,4, and 6 are dependent on objected claim 2.

Claims 28-29, 31 are dependent on objected claim 27.

With respect to claims 8 and 33, Iiunuma and Shapira combined disclose the method of claim 7 and 32, however the prior art does not disclose wherein implementing said modulator to reduce signal delay between a sum path for the combined signals and individual channels receiving said plurality of input signals.

Claims 9 and 34 are dependent on objected claim 8 and 33.

With respect to claims 11 and 36, Iinuma and Smee combined disclose the method of adding an error step as disclosed in claim 10, however the prior art does not disclose wherein said error signal is 180 degrees out of phase with a sum channel combining said plurality of input signals.

With respect to claims 12 and 37, Iinuma discloses the method of claim 1 and 26 wherein said weights are determined by a combination of maximal ratio combining MRC to align phases of said input signals to the same phase and to scale said input signals in proportion to a square root of a received signal to noise ratio and an interference nulling algorithm for generating said weights using an error signal which is 180 degrees out of phase with a sum channel combining said plurality of said input signals.

Claims 13-15 and 38-40 are dependent on objected claim 12 and 37.

With respect to claims 17 and 42, Iinuma discloses the method of claim 16 and 41, however the prior art does not disclose wherein said conjugate of one of said weights is determined from said one of said weight having a largest magnitude.

With respect to claim 18 and 43, Iinuma discloses the system of claim 12 and 37 wherein combining said weights determined from said MRC with weights determined from one or more second MRC; however the prior art does not disclose wherein combining weights determined from said IMA with weights determined from or more second INA.

With respect to claim 22 and 47, Iinuma discloses the method of claim 20, however the prior art does not disclose wherein said input signal is a time division duplex signal and a control signal is used to freeze said weights at an end of a packet and use said weights for transmitting a signal in step d.

Claim 23 is dependent on objected claim 22.

With respect to claim 48, Vayer discloses the system of claim 44 wherein said system is used for a plurality of devices and further comprising: means for identifying said weights for one said devices; however the prior art does not disclose wherein the system includes means for storing said identified weights; and said means for

transmitting retrieving said stored identified weight for said device for use in

transmitting.

Conclusion

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

The Riazi reference (US 6,580,705) discloses a signal combining scheme for

wireless transmission systems having multiple modulation schemes.

The Hoctor reference (US 6,914,539) discloses a system and method for a low

rate, in-band broadcast communication for medical telemetry.

The Boesel reference (US 2004/0071104) discloses a multi-mode method and

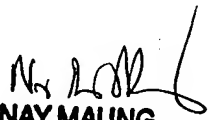appartatus for performing digital modulation and demodulation.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Richard Chan whose telephone number is (571) 272-

0570. The examiner can normally be reached on Mon - Fri (9AM - 5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Nay Maung can be reached on (571)272-7882. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the
Patent Application Information Retrieval (PAIR) system. Status information for
published applications may be obtained from either Private PAIR or Public PAIR.
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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should
you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free).

Richard Chan
Art Division 2618
05/04/06

NAY MAUNG
SUPERVISORY PATENT EXAMINER